A Collection of Cognitive Strategies for Teachers

**Cognitive strategies** provide a structure for learning that actively promotes the comprehension and retention of knowledge through the use of engaging strategies that acknowledge the brain's limitations of capacity and processing.

***HSTW*** Foundational Belief: *Most students become “smarter” through effort and hard work. Schools improve student achievement when they create structures that cause students to work hard to learn.*

***HSTW* Conditions to Accelerate Student Achievement**:

|  |  |  |
| --- | --- | --- |
| Clear Mission | Strong Leadership | Continuous Improvement |
| Qualified Teachers | Professional Development | Commitment to *HSTW* Goals |

**Ten Key *HSTW* Practices:**

|  |  |  |
| --- | --- | --- |
| High Expectations | Program of Study | Academic Studies |
| Career/Technical Studies | Work-based Learning | Teachers working together |
| Students Actively Engaged | Guidance and Advisement | Extra Help |
| Culture of Continuous Improvement | | |

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\*Information compiled by the Guilford County North Carolina Schools and can be found at <http://its.guilford.k12.nc.us>.)

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∆∆*Literacy Across the Curriculum: Setting and Implementing Goals for Grades Six Through 12*. The Southern Regional Education Board, *High Schools That Work*. [www.sreb.org](http://www.sreb.org)

††Wiederhold, Dr. Chuck W. and Dr. Spenser Kagan. Cooperative Learning and Higher Level Thinking: The Q-Matrix. Kagan Cooperative Learning. 1998. ISBN 1-879097-9

**Collaborative Pairs**

**Link to Learning**: *Much of learning occurs in social situations. Learning is at first a social activity before it is a cognitive activity.*

This section examines the shift in perspective that is often necessary for people to come to understand a model of teaching and learning that is different from those of the cultural and academic community in which they were raised. Most of us grew up with models of how people learn that are based on ideas that learners acquire or experts transmit pieces of knowledge. This makes it extremely difficult to understand the more recent and much better research that indicates learning is constructed by the learner and must be a social experience before it is a cognitive experience.

1. Collaborative pairs are the organizational tool for the “learning” classroom. The base grouping of a classroom for new content and/or skill learning is two. For students to learn new information, they need to “play with it in their mind.”
2. It is nearly impossible for learners to think about one thing and talk about another. Therefore, getting students talking about the concept or skill increases their thinking about that concept/skill. It also increases accountability for learning because … it is hard to get lost in a pair!
3. The collaborative pairs strategy works best for learning in guided practice and summarizing. The third strong possibility is for linking prior knowledge. If you want to group the collaborative pairs then the grouping pattern is:
   1. Low to average
   2. Average to average
   3. Average to high
4. Grouping low to high is peer tutoring, not collaborative pairs. Peer tutoring is best for reinforcing recently learned content, not for guided practice on new content. Never group low to low. This results in very little learning.
5. Excellent beginning strategies for collaborative pairs area:
   1. **Numbered Heads** (Students are in pairs. Each student has a number, 1 or 2. Activities spread throughout the lesson are; summarize, clarify/explain, predict or questions for test. An example – after a brief lecture/discussion the teacher says, “#1 summarize what you have learned for #2.” Then, picking groups at random, “#2, what did #1 say?”
   2. **Think, Pair, Share** (First direction – Think. 30 to 60 seconds. Second direction – Share with your partner. 60 seconds. Third direction – Share with class, but not all groups!)
   3. **Pairs Checking** – (Each students does their own work. Have students circle even numbered items. Tell students, “Do your own work. When you get to a number that is circled, STOP! You cannot go on unless the previous answers agree with your partner’s answers. If they disagree, continue working. If they do not agree, justify your answers until you and your partner agree.”

**3 X 3 Vocabulary**

**Purpose:**To promote the development of complete sentences as well as the identification of relationships between concepts

**Description:** In this activity, students will take related words, ideas, and concepts and combine them together in sentences. The sentences should illustrate the relationship among the words, ideas, and concepts. This can be used as a form of alternative assessment as well as a cognitive teaching strategy.

**Procedure:**

1. Pass out a 3x3 Vocabulary sheet to each student.
2. The sheet can be filled out in one of two ways: (1) Assign specific words to their blocks, or (2) allow students to choose from a word list, placing words in the blocks they choose.
3. Once the sheet is filled out, students should write six sentences which illustrate the relationships between the words in column 1 down, 2 down, 3 down, and rows 1 across, 2 across, and 3 across.

**Variation:** Spence Rogers uses a variation of the 3x3 Vocabulary activity. In his activity, Mix and Match, related word, ideas, and concepts are written on individual index cards. All cards are put into a basket. In round robin fashion, cards are drawn two at a time. The student then must generate a sentence using those two words which describes their relationship to each other.

**Sample** **3 x 3 Vocabulary**

|  |  |  |
| --- | --- | --- |
| **Filter** | **Database** | **Field** |
| **Data** | **Sort** | **Row** |
| **Report** | **Descending** | **Ascending** |

**Column 1 Down:** After filtering my data for all countries located in the Nordan region, I ran a report of their major imports and exports.

**Column 2 Down:** I sorted my database in descending order so that I could look at my records in alphabetical order.

**Column 3 Down:** While my database contains both fields and rows, the only way I can sort in ascending order is by field.

**Column 1 Across:** Using the filter tool in my database application, I can isolate data in particular fields.

**Column 2 Across:** When I sort my data, I do so by fields, not by rows.

**Column 3 Across:** When running a data report, I can choose to have my data in either descending or ascending order.

**CLVG**

**Collaborative Listening and Viewing Guide**

**Purpose:** To help students learn from visual information

**Description:** The collaborative listening and viewing guide is a lesson framework to help students learn from information observed and/or heard. It can be used to manage and organize content learned from experiments, demonstrations, lectures, information on field trips or videotapes.

**Procedure:**

1. Preview/review information. In this introductory phase, give an overview of the topic, pre-teach significant terms if needed and/or elicit the students' background knowledge on the topic. This information can be organized on the board in the form of a semantic map.
2. Record individually. Instruct the class to write down significant ideas, concepts, phrases, etc. on the left-hand side of their paper. Students should be instructed to be brief and use abbreviations as needed. Notes should be recorded in sequential order.
3. Elaborate in small groups. After viewing the video, have the students get into groups to elaborate on their individual notes. Here, they can recall details, extend ideas, add personal anecdotes, etc. Then they record this information on the right hand side of their forms.
4. Synthesize with Whole Class. Tell the students to contribute what they learned from their group recollections and then record their responses on the board, chart paper, or transparency. This information can then be reorganized as a map, chart, or in outline form if appropriate.

Wood, K.D. (1994) Practical strategies for improving instruction. Columbus, OH: National Middle School Association.

Student’s Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Partner’s Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

My Notes My Partner’s Notes

|  |  |
| --- | --- |
| (*This chart should be the size of a regular piece of notebook paper. Students can be asked to draw their own chart*.) |  |

We learned that: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Concept Mapping**

**Purpose:**To activate and engage students during all stages of the learning process

**Description:** Using concept mapping, students construct a model for organizing and integrating the information that they are learning. Concept mapping can be use prior to an assignment as a brainstorming activity, during an assignment as an organizing strategy, or as a post-assessment activity.

**Procedure:**

1. Choose a key word or topic related to a unit of study.
2. Write the word on an overhead transparency or on a sheet of chart paper.
3. Ask students to think of as many words and ideas as they can that relate to the focal word.
4. Write the words on a map in clusters or categories.
5. Have the students suggest labels for the categories and write them on the map.
6. If there are any key vocabulary words that are important to the comprehension of a reading assignment and students do not mention them, add them to the map with a red marker or pen.
7. Discussion of the concept map is the most important part of the lesson. This helps students become aware of their current thinking and helps them to see relationships between words and ideas.
8. After the reading assignment, or as the unit progresses, new words and categories can be added to the map. Use different colors of ink to show that this information was not known prior to the reading or unit of study.

Lipton, L., & Wellman, B. (1998). Patterns and practices in the learning-focused classroom. Guilford, Vermont: Pathways Publishing.

Sample concept map for Microsoft™

Access

Filter

Sort

Field

Record

PowerPoint

Slide

Action Button

Hyperlink

Animation

**Microsoft Office**

Word

Format

Align

Font

Style

Tab

Excel

Cell

Formula

Function

Column

**Cubing**

**Cubing: A procedure used to help students think about a certain concept in different ways.**

**Procedure:**

1. Cut out the figure below.
2. Fold it into a cube.
3. Give it to a student and have them roll it like a die.
4. The side of the cube facing up describes what the student must do the concept/idea/topic being discussed. (For example, if the topic is “inflation” and “describe it” category came out on top, the student would have to describe it. (Categories on the cube can be changed.)

|  |  |  |
| --- | --- | --- |
|  | Apply It |  |
| Argue For or Against It | Describe It | Associate It |
|  | Compare It |  |
|  | Analyze It |  |

Academic Solitaire

The purpose of “Academic Solitaire” is to reinforce concepts. This activity can also be used to introduce a concept.

The teacher prepares a deck of cards for each team. The number of cards can vary.

Each deck consists of cards labeled with the primary concepts or terms currently being studied. Remaining cards would consist of the properties, characteristics or attributes of those concepts. A sequential listing would probably be favored here (but is not required for the activity - - think of an organizational outline and headings, subheadings, topics and subtopics).

Each team receives a complete deck of thoroughly shuffled cards so that the categories, which are sorted, are not obvious. Every card should be playable (be aware if a card can fit into more than one category).

The students/teams play the cards like a game of solitaire (determining a “heading card” and playing the remaining cards).

The students should first view all of the cards to get sense of the categories (headings) and establish them. They then group and organize the remaining cards under those categories, creating what is, in essence, a map.

Scoring: Students will explain/justify their ordering of the cards. One point for each correctly played card. A time limit may be placed on the game. Teams could earn additional points based on the order of finish and the correctness of answers.

For an introductory study of atomic structure and bonding the terms could be: atomic particles, proton, neutron, electron, chemical bonds, covalent, ionic, metallic, metal, Na, K, Fe, Non-metal, Cl, Ar, Xe, Na+, Cl-, Fe++, Ions, Phases, gas, liquid, solid, plasma, Predictable properties, valence electrons, mass, type of element, etc. (A “trick” card or cards can be used. For example, suppose a card read Xe+. Students have learned, hopefully, that stable elements like Xe will not form ions. It will be interesting to observe how they solve this problem.)

**Lecture**

A lecture is an activity in which the teacher presents information and knowledge orally through a series of organized and structured explanations. Lectures can be both formal and informal. Formal lectures allow for very limited or nonexistent student interaction. Interactive or informal lectures increase student retention of information by 20 percent over formal lectures.

In contrast to other instructional/cognitive strategies, lecture generally involves the least amount of student involvement. However, there are some ways to vary the lecture approach to make the process more beneficial for the students.

1. Feedback lecture
2. Guided lecture
3. Responsive lecture
4. Demonstration lecture
5. Pause Procedure lecture
6. Think/Write/Discuss lecture

Feedback lecture: Provide students with a set of readings and an outline of the lecture notes prior to the lecture. Lecture for ten minutes and then divide the students into study groups for twenty minutes. During the study group sessions, assign student groups a question related to lecture material to consider. Reconvene the students for another ten-minute lecture, and address the assigned study question in your comments.

Guided Lecture: Provide students with a list of objectives for the lecture. Have them put down their pencils and listen carefully to the lecture for twenty minutes, attempting to remember the information given. At the end of the lecture, give students five minutes to write all the information they can recall individually. Next, involve students in small discussion groups to reconstruct the lecture by combining notes. Help students fill in missing information as they identify it.

Responsive Lecture: Devote one class period a week to answering open-ended, student-generated questions on any aspect of a given topic or unit of study. A few rules apply to streamline the question and answer process. All topics have to be presented as questions; students can submit questions as long as they specify why they think they are important; the class order the questions in terms of general interest; and, the lecturer answers as many of the questions as time allows.

Demonstration Lecture: During the lecture, take time to stop and demonstrate a laboratory-type application to illustrate selected principles of the lecture content. Pose a series of “What will happen if we …” questions to encourage student interaction and to provide investigative opportunities as part of the lecture process.

Pause Procedure Lecture: Deliver a twenty-minute lecture and have students take notes on the content. Every five or six minutes, pause during the lecture and give students approximately two minutes to share their notes with a partner and to fill in any missing information or correct any mistakes.

Think/Write/Discuss Lecture: Prepare a set of three related questions to ask students throughout the lecture.

* Give the first question – a motivational question that helps set the stage for the lecture – before the lecture, and have students write a two-minute response to it. For example, ask, “What are three things you know about mammals?” or “What would you like to know about the people of China?” or “What was your favorite childhood poem or nursery rhyme, and why?” If time allows, ask some of the students to share their responses orally and with the whole group.
* During the middle of the lecture, pose another question to clarify the information given. Ask the students to write a short response to you, sharing some of their ideas aloud if possible. Questions that ask, “How would you define a rhombus?” or “What facts did you understand about tides?” or “Why do we use figurative language in poetry?” are good examples of the midpoint questions.
* At the end of the lecture, ask students to reflect on some type of feedback question, such as, “What was the most interesting idea you learned from the lecture?” or “What aspect of this topic would you like to know more about?” or “Why is poetry considered an art form?”

Another option is the 10:2 method. Present for ten minutes and then allow two minutes for review. Repeat this cycle three times. During the last review period (5 minutes) allow students to ask clarifying questions.

**Dump and Clump**

Purpose**:** To provide a step by step process for organizing thinking and facilitating learning of new and difficult material.

Description**:** This is a great strategy to use when the students are faced with learning new and difficult information. It provides students with a process for organizing their prior knowledge and making projections. Depending on the subject matter, this strategy could utilize up to a full class period.

Procedure**:**

1. Group students into small groups of 2-3
2. "Dump"- Have students develop a list of words, items, or new information related to the topic of study.
3. "Clump"- Using the "dump" word list, students should then group words on the list into categories and assign labels.
4. Have students write a descriptive summary sentence for each category of words in their list.
5. Upon completion, these should be posted around the room or shared in some manner with the entire class.

Rogers, S., Ludington, J., & Graham, S. (1999). Motivation and learning. Evergreen, CO: Peak Learning Systems.

**Dump and Clump**

Directions: Brainstorm words related to your topic. Place these words in the "Dump"ster. Then, pull your words out of the dumpster and clump them into categories. Finally, assign your category labels and write a summary sentence (on the back) describing each category.

**The Dumpster**

**The Clumpster**

**Four Corners**

**Purpose:** To stimulate student learning through movement and discussion

**Description:** Students will be presented with a controversial scenario. In each of the four corners of the classroom, an opinion about the scenario will be posted. Students will then express their opinion about the scenario by standing in front of one of four statements with students who share their same opinion.

**Procedure:**

1. Generate a controversial scenario related to your topic of study.
2. Formulate four divergent opinions related to the scenario. Post these on chart paper in the four corners of your classroom.
3. Present the controversial scenario to your students.
4. Ask students to move to one of the four corners. Students should move to the corner with the statement that most closely fits their opinion of the controversial scenario.
5. Follow up by having students present a group summary of their opinion. This can be done through an oral presentation or by using a strategy such as an Opinion-Proof T-chart or a RAFT.

**Sample Scenario:**

Tell students that the school board has run out of money. The only way that they can keep Internet access in schools is to charge the students for using the school's Internet access.

* Students should be charged .10 per minute for the total amount of time that they are online using the Internet. This would be payable on a weekly basis.
* Students should be charged a flat rate of $2.00 for each day that they use the Internet. Each day would come with unlimited access.
* Students should be charged a flat rate of $50.00 per year for unlimited access to the Internet.
* The school board should eliminate school access to the Internet.

After students report to their corners, have them work collaboratively to write the school board a letter convincing them of their point of view.

**Frayer Model**

**Purpose:**To promote vocabulary development and student thinking

**Description:** Using the Frayer Model, students will activate their prior knowledge of a topic, organize knowledge into categories, and apply their new knowledge to the compartmentalized structure.

**Procedure:**

1. Brainstorm a list of ideas related to your topic.
2. Have students read a selection or participate in an activity related to your topic.
3. Pass out a blank copy of the Frayer Model.
4. Using their brainstormed words and new knowledge of a topic, students will group their words into one of four categories: Essential Characteristics, Non-essential Characteristics, Examples, and Non-examples.
5. Have students add additional words to the Frayer Model until all four categories are substantially represented.

Hint: Once students have learned how to utilize the Frayer Model for understanding topics in depth, the model can be used as a form of assessment or even at the beginning of a lesson as a brainstorming activity.

Buehl, D. (2001). Classroom strategies for interactive learning. Newark, DE: International Reading Association

**Frayer Model**

|  |  |
| --- | --- |
| **Important Characteristics** | **Non-Important Characteristics** |
| **Examples** | **Non-Examples** |

**Power Notes**

**Purpose:**To assist students in organizing information while differentiating between hierarchies of importance

**Description:**  Power note-taking is a strategy used to record essential information while denoting its level of importance. Students who use Power Notes will be differentiating between levels of importance by designating a Power level to each information bit recorded in their Power Notes.

**Procedure:**

1. Model the Power Notes strategy with a common example like animals:

Power 1: Animals

Power 2: Domestic

Power 3: Dogs

Power 4: German Shepherd

Power 4: Dalmatian

Power 4: Cocker Spaniel

Power 3: Cats

Power 4: Calico

Power 4: Siamese

Power 2: Wild

Power 3: Indigenous to Africa

Power 4: Giraffe

Power 4: Hippopotamus

Power 3: Indigenous to India

Power 4: Elephant

1. Select an appropriate, information rich reading, video, or other source of information to share with the students.
2. Pass out a Power Notes structure with Power 1's and 2's already filled out
3. Allow students to use the Power Notes organizing structure to take notes, filling in the remaining levels of Power with information from your primary source of material.

Hint: For advanced students or those familiar with Power Notes, eliminate the provision of the Power Notes structure. Allow students to create their own structure from scratch as they read, view, or listen for information.

Q-Matrix\*

The Q-Matrix is a visual for categorizing questions into (1) knowledge level, (2) comprehension, application and analysis, (3) synthesis and (4) synthesis/evaluation. Another element is time frame. (Refer to the chart below the matrix.)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EVENTS** | **SITUATIONS** | **Alternatives** | **PEOPLE** | **REASONS** | **MEANS** |
| **1.**  **What is it?** | **2.**  **Where/When Is?** | **3.**  **Which is?** | **4.**  **Who is?** | **5.**  **Why is?** | **6.**  **How is?** |
| **7.**  **What did?** | **8.**  **Where/When did?** | **9.**  **Which did?** | **10.**  **Who did?** | **11.**  **Why did?** | **12.**  **How did?** |
| **13.**  **What can?** | **14.**  **Where/When can?** | **15.**  **Which can?** | **16.**  **Who can?** | **17.**  **Why can?** | **18.**  **How can?** |
| **19.**  **What would?** | **20.**  **Where/When would?** | **21.**  **Which would?** | **22.**  **Who would?** | **23.**  **Why would?** | **24.**  **How would?** |
| **25.**  **What will?** | **26.**  **Where/When will?** | **27.**  **Which will?** | **28.**  **Who will?** | **29.**  **Why will?** | **30.**  **How will?** |
| **31.**  **What might?** | **32.**  **Where/When might?** | **33.**  **Which might?** | **34.**  **Who might?** | **35.**  **Why might?** | **36.**  **How might?** |

**Numbers represent question stems from the Q-Matrix.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Frames** | **Knowledge** | **Comprehension, Application and Analysis** | **Synthesis** | **Synthesis and Evaluation** |
| The Present:  1 – 6  The Past:  7 – 12  Possibilities:  13 – 18  Probabilities:  19 – 24  Predication:  25 – 30  Imagination:  31 - 36 | 1  2  3  7  8  9  13  14  15 | 4  5  6  10  11  12  16  17  18 | 19  20  21  25  26  27  31  32  33 | 22  23  24  28  29  30  34  35  36 |

Wiederhold, Dr. Chuck W. and Dr. Spenser Kagan. Cooperative Learning and Higher Level Thinking: The Q-Matrix. Kagan Cooperative Learning. 1998

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Divergent Questions

Divergent questions encourage unique and divergent thinking and stimulate originality. The following questioning models can be utilized in all subject areas. Questioning can be directed from the perspectives of *quantity, point of view, personal involvement, and reorganization*. Creativity! Ask one of these questions each day in class, everyday, and see how students begin to think.

Quantity Model

Pattern:

How many ways…..

How many ideas…..

List all of the…..

Examples:

List as many things as you can that are red.

List all the things that are round.

List all the ways that we use a bell.

Viewpoint Model

Pattern:

How would this look to a ………..

What would this look like to a ……

What would a \_\_\_\_\_\_\_\_mean from the viewpoint of a\_\_\_\_\_\_\_…..

Examples:

How would Columbus feel about Neil Armstrong walking on the moon?

What would a blind person say about sand?

What would a vulture say is its duty in nature’s scheme of things?

Involvement Model

Pattern:

How would it feel if it were human and could feel?

How would you feel if you were\_\_\_\_\_\_\_\_\_\_\_?….

Examples:

Become a traffic sign. Describe how you feel.

How would you feel if you were the first person to see the Mississippi River?

You awake and you’ve been turned into a wheelbarrow- - how is you life different?

Reorganization Model

Pattern:

What would happen if\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

Suppose\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

What would be the consequences?……

Examples:

What would happen if it rained every day for four hours?

What would happen if cars never wore out?…

What would happen if everyone had to do military duty

**RAFT**

**Purpose:** To engage student learning through analysis and synthesis of

information

**Description:** Using this strategy, students will take on the role of someone or something related to the topic of study. They will then generate a product for a designated audience. This activity requires students to both analyze and synthesize information previously introduced. The creative thinking required for completion of this product addresses many of the higher levels of Bloom's Taxonomy of Learning.

**Procedure:**

1.     Introduce this activity by explaining the RAFT acronym:

R-Role of the writer

A-Audience to whom the product is being directed

F-Format of the product being created

T-Topic of the product

Example: Pretend that you are an ant trying to convince a young boy not to step on you. (R- ant, A- young boy, F- verbal plea, T- convincing the boy not to step on you)

2.     Pass out a sheet of possible roles, audiences, and formats.

3.     Assign students to create a RAFT for a given topic related to your unit of study.

4.     Allow students to share their RAFTs with the class in the form of short presentations.

**Examples of RAFT Assignments**

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Audience** | **Format** | **Topic** |
| Newspaper Reporter | Readers in the 1870’s | Obituary | Qualities of General Custer |
| Lawyer | U.S. Supreme Court | Appeal Speech | Dred Scott Decision |
| Abraham Lincoln | Dear Abby | Advice Column | Frustrations with his generals |
| Oprah | Television Public | Talk Show | Women’s suffrage in early 20th century |
| Graham Cracker | Other Graham Crackers | Travel Guide | Journey through the digestive system |
| Josef Stalin | George Orwell | Book Review | Reactions to *Animal Farm* |
| Lungs | Cigarettes | Complaint | Effects of Smoking |

**Semantic Feature Analysis**

**Purpose:**To help students understand critical vocabulary and key concepts in a reading selection or unit of study.

**Description:** Students draw upon their background knowledge to generate relationships between ideas and topics within a category. The key features of these words are displayed on a grid that visually organizes and clearly presents important relationships.

**Procedure:**

1. Select a category or topic for the semantic feature analysis.
2. Down the left side of the chart, list four to five words that name objects or words related to the category. These words should be familiar to students.
3. In the row across the top of the chart, list traits and properties shared by some of the words that are listed in the first column on the left side of the chart.
4. Moving through the chart, determine which objects/words possess each of the traits and properties listed across the top of the chart. Use a plus sign (+) to indicate that the object/word usually possesses this feature. Use a negative sign (-) to indicate that it does not. A question mark (?) can be entered when students do not know or are unsure.
5. When the chart is completely filled in, examine and discuss patterns. Support students in forming generalizations about the objects/words in the category as well as focusing on what make each object/word unique.

Lipton, L., & Wellman, B. (1998). Patterns and practices in the learning-focused classroom. Guilford, Vermont: Pathways Publishing.

An example Semantic Feature Analysis from “Computer Applications.”

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Computer Applications** | **Contains Information** | **Can Analyze Information** | **Used to Present Information** | **Uses Grid-like Columns and Rows** | **Can Be Saved as a Template** |
| Word Processing | + | - | + | - | + |
| Database | + | + | - | + | + |
| Spreadsheet | + | + | + | + | + |
| Multimedia | + | - | + | - | + |

**Venn Diagram**

**Purpose:**To compare and contrast concepts

**Description:** The Venn Diagram is one of the most basic graphic organizers currently used by teachers. Using the Venn Diagram form, students are able to compare and contrast characteristics of two concepts, ideas, or words. They provide a visual display of similar and different attributes that can be used to launch discussion, writing, or further research.

**Procedure:**

1. Draw to overlapping circles on an overhead transparency or chart paper.
2. Label each side with the name of one of the things you are comparing.
3. Fill in one side with attributes belonging to that item.
4. Fill in the other side with attributes belonging to that item.
5. Now fill in the center area where the two items share attributes.

Hint: Venn Diagrams can be used to compare more than two items by adding additional circles. However, students will need to become comfortable with using a basic Venn before you introduce multiple concepts in the same diagram.

While the Venn Diagram is in almost every teaching strategy book, directions for this activity were modeled after:

Lipton, L., & Wellman, B. (1998). Patterns and practices in the learning-focused classroom. Guilford, Vermont: Pathways Publishing.

**Mnemonics**

Mnemonic strategies are memory aids that provide a very systematic approach for organizing and remembering facts that no apparent link or connection of their own.

Mnemonics provide the tools necessary to memorize and to recall almost any information. “Forgetting” (lack of recall) occurs rapidly unless certain steps are taken to process the information into memory. Mnemonics can provide the pathways for those steps.

**Mnemonic Hints**:

Get physical (orally recite, write, gesture, etc.)

Visualize (form pictures in your mind)

Link Information (Hook new to old, group material)

**Memory Processes**:

Encoding: process of readying information for storage. (If the brain does not have a “ready to use” category for storing new information, it will not get stored. For example, hearing the word “dreadnought” is meaningless unless the storage place, or concept, for battleship is already in the brain.)

Storage: saving information for use in the future

Retrieval: recalling information from storage

The mind is built to remember. Forgetting is actually a lack of recall due to memory blocks or the misplacement of the information. (One category for brain storage is “useless information.” This is short term memory. In the classroom one task is to help students develop meaningful storage areas, or concepts, in the brain.)

**Mnemonic Strategies for Improving Memory**

|  |  |  |
| --- | --- | --- |
| **Strategy** | **Definition** | **Example** |
| **Mind Map** | Organize mental maps from known information; then fill in missing information; main ideas, details, categories/parts, diagram labels. | Government  ↓  Congress  ↓ ↓  Senate House |
| **Visual Chains** | A visual cycle of pictures and/or words: cause/effect, linking systems, sequencing | O2 → Person  ↑ ↓  Plant ← CO2 |
| **Acronyms** | Let the first letter of each word in a sentence represent the first letter of the words/list you wish to memorize: lists, sequencing | **Please Excuse My Dear Aunt Sally** (Order of operations – parentheses, exponents, multiply, divide, add and subtract)  **H** uron  **O** ntario  **M** ichingan  **E** rie  **S** uperior |
| **Word Links** | Use the meaning of one word to associate with another: definitions, pairs | The capitol of Oregon is Salem. (Think: There are many sailboats in Oregon because it is on the ocean. What do you do with these boats? Sail em.) |
| **Poems, Rhymes, Nonsense verses, Lyrics** | Using a familiar tune, substitute information to be learned: details, sequencing | “Mary Had a Little Lamb”  “The ABC Song”  “In 1492 Columbus sailed the ocean blue.” |
| **Hookups** | Using one word or series of letters, “hook up” information beginning with the same letter: details, categories/parts, lists | N New Mexico  North Carolina  Nevada  A Alabama  Arkansas  T Texas  Tennessee |
| **Write It!** | Write it repeatedly and say it aloud as you write: almost anything | Write it just before you go to sleep |
| There are many, many more | | |

**Reciprocal Teaching**

"**Definition:** Reciprocal teaching refers to an instructional activity that takes place in the form of a dialogue between teachers and students regarding segments of text. The dialogue is structured by the use of four strategies: summarizing, question generating, clarifying, and predicting. The teacher and students take turns assuming the role of teacher in leading this dialogue.

**Purpose:** The purpose of reciprocal teaching is to facilitate a group effort between teacher and students as well as among students in the task of bringing meaning to the text. Each strategy was selected for the following purpose:

* **Summarizing** provides the opportunity to identify and integrate the most important information in the text. Text can be summarized across sentences, across paragraphs, and across the passage as a whole. When the students first begin the reciprocal teaching procedure, their efforts are generally focused at the sentence and paragraph levels. As they become more proficient, they are able to integrate at the paragraph and passage levels.
* **Question generating** reinforces the summarizing strategy and carries the learner one more step along in the comprehension activity. When students generate questions, they first identify the kind of information that is significant enough to provide the substance for a question. They then pose this information in question form and self-test to ascertain that they can indeed answer their own question. Question generating is a flexible strategy to the extent that students can be taught and encouraged to generate questions at many levels. For example, some school situations require that students master supporting detail information; others require that the students be able to infer or apply new information from text.
* **Clarifying** is an activity that is particularly important when working with students who have a history of comprehension difficulty. These students may believe that the purpose of reading is saying the words correctly; they may not be particularly uncomfortable that the words, and in fact the passage, are not making sense. When the students are asked to clarify, their attention is called to the fact that there may be many reasons why text is difficult to understand (e.g., new vocabulary, unclear reference words, and unfamiliar and perhaps difficult concepts). They are taught to be alert to the effects of such impediments to comprehension and to take the necessary measures to restore meaning (e.g., reread, ask for help).
* **Predicting** occurs when students hypothesize what the author will discuss next in the text. In order to do this successfully, students must activate the relevant background knowledge that they already possess regarding the topic. The students have a purpose for reading: to confirm or disprove their hypotheses. Furthermore, the opportunity has been created for the students to link the new knowledge they will encounter in the text with the knowledge they already possess. The predicting strategy also facilitates use of text structure as students learn that headings, subheadings, and questions imbedded in the text are useful means of anticipating what might occur next.

In summary, each of these strategies was selected as a means of aiding students to construct meaning from text as well as a means of monitoring their reading to ensure that they are, in fact, understanding what they read.

**Research Base:** For the past five years, Palincsar and Brown (1985) have conducted a series of studies to determine the effectiveness of reciprocal teaching. The initial studies were conducted by adult tutors working with middle school students in pairs and by Chapter 1 teachers working with their small reading groups averaging five in number. The students were identified to be fairly adequate decoders but very poor comprehenders, typically performing at least two years below grade level on standardized measures of comprehension. Instruction took place over a period of 20 consecutive school days. The effectiveness was evaluated by having the students read passages about 450 to 500 words in length and answer 10 comprehension questions from recall. The students completed five of these passages before reciprocal teaching instruction began and one during each day of instruction. Performance on these assessment passages indicated that all but one of the experimental students achieved criterion performance, which we identified as 70 percent accuracy for four out of five consecutive days.

These results were in contrast to the group of control students, none of whom achieved criterion performance. In addition, qualitative changes were observed in the dialogue that occurred daily. For example, the experimental students functioned more independently of the teachers and improved the quality of their summaries over time. In addition, students' ability to write summaries, predict the kinds of questions teachers and tests ask, and detect incongruities in text improved. Finally, these improvements were reflected in the regular classroom as the experimental students' percentile rankings went from 20 to 50 and above on texts administered in social studies and science classes.

When the same instructional procedure was implemented in larger classes with groups ranging in size from 8 to 18, 71 percent of the students achieved criterion performance as opposed to 19 percent of the control students who were involved in individualized skill instruction. Furthermore, teachers observed fewer behavior problems in their reciprocal teaching groups than in their control groups." (pp. 19-20)

**One Strategy for Reciprocal Reading**

You might also consider implementing reciprocal teaching the way Donna Dyer of the North West Regional Education Service Agency in North Carolina recommends. Here's one way she suggests you use reciprocal teaching:

1. Put students in groups of four.
2. Distribute one note card to each member of the group identifying each person's unique role.
   1. summarizer
   2. questioner
   3. clarifier
   4. predictor
3. Have students read a few paragraphs of the assigned text selection. Encourage them to use note-taking strategies such as selective underlining or sticky-notes to help them better prepare for their role in the discussion.
4. At the given stopping point, the Summarizer will highlight the key ideas up to this point in the reading.
5. The Questioner will then pose questions about the selection:
   1. unclear parts
   2. puzzling information
   3. connections to other concepts already learned
   4. motivations of the agents or actors or characters
   5. etc.
6. The Clarifier will address confusing parts and attempt to answer the questions that were just posed.
7. The Predictor can offer guesses about what the author will tell the group next or, if it's a literary selection, the predictor might suggest what the next events in the story will be.
8. The roles in the group then switch one person to the right, and the next selection is read. Students repeat the process using their new roles. This continues until the entire selection is read.

**Proposition/Support Outlines**

Proposition/support (or opinion/proof) outlining is an organizational system that teaches students how to support an argument with evidence. Students find this format useful for organizing information from reading assignments and for pre-writing activities.

Students can use proposition/support outlining before, during, or after reading. It provides them with a structure that helps them organize their thinking, writing, and classroom discussions. Students can develop their own opinion and find evidence for support, or the teacher can give the students a statement to prove. This strategy helps students develop and use higher level thinking skills and is appropriate in all content areas.

**Procedure:**

1. Direct the students to divide their paper into two columns and label the columns “proposition” and “support” or “opinion” and “proof.” Do the same on an overhead transparency or the chalkboard.
2. Have students read the assigned selection.
3. Model the strategy for students by developing a proposition or opinion statement based on the selection.
4. Show students how to support this statement with details from the selection. Add these details to the support column on the class outline on the overhead or chalkboard.
5. Have the students develop their own propositions or opinions from the selection and find evidence in the selection to support it. Guide them on using the outlines as a framework.
6. Guide the students as they construct a summary paragraph based on the proposition statement and the details that support it. Eventually students may use their outlines to write longer position papers.
7. Guide the students in analyzing their summaries by using a checklist.

**Sample Proposition/Support Checklist**

* Is my statement clear?
* Do I need more evidence to support my statement?
* Is my most convincing fact placed in a position in my paragraph that will make it stand out clearly?
* Could I move my facts around in a way that would make my ideas clearer to my readers?

**Example 1: Social Studies Proposition/Support**

|  |  |
| --- | --- |
| **Proposition** | **Support** |
| Constitutional convention was necessary | * Articles of Confederation were weak and caused concern about the new government. * Trade between states was problem; colonies competed with one another. * Lack of power over foreign trade; no central government with power to impose tariff. * Lack of power to enforce treaties; foreign countries did not recognize American government |
| Conclusion | The Articles of Confederation had to be revised because of its weakness. The country needed a new executive branch, a judicial branch, and a strong central government. |

Example 2: Social Studies Opinion/Proof

|  |  |
| --- | --- |
| **Opinion** | **Proof** |
| Napoleon was a great leader. | * Ended revolution * Drew up new constitution * Fair taxation * Government workers chosen for ability |

Supporting Summary

Napoleon was a great leader. He brought an end to the revolutionary fighting in France and then established a national police force to keep peace. He told all the nobles who had fled the country during the fighting that they could return home. Napoleon also drew up a new constitution that gave all male citizens the right to vote. All citizens, including the rich, were made to pay taxes and government workers were chosen for their ability. It did not matter who they were. And last, but not least, he led the military to many victories.

Opposing Summary

Napoleon was not a great leader. He cost France many lives during all those years when he tried to rule the world. The people who had run away during the revolution could only come back to their homes if they supported him. Also, he only allowed men to vote; he didn’t think women would do a good job.

**Graphic Organizers**

Graphic organizers are tools that teachers and students use to establish organizational patterns for their thinking, writing, discussions and reporting. Graphic organizers provide the structure for recording information, ideas and options. They make the content visual to the learners.

Graphic organizers link higher order thinking skills and textbook organization. Textbooks are organized by (1) sequence (2) listing (3) compare/contrast (4) cause/effect and problem/solution. Consequently, use graphic organizers that follow text organization.

*The average student studying with the aid of organizers learns as much as the 90th percentile student studying the same content without the assistance of organizers*. The use of organizers produces learning effects that are substantial and long-lasting.

The five most common uses for Graphic Organizers –

1. Structured note-taking
2. Guided writing assignments for summarizing and reporting
3. Guided reading assignments
4. Overview of chapter or unit
5. Visual description across assignments

Some examples:

Fishbone (cause and effect) diagram – A graphic representation of systemic elements that may contribute to a problem or issue. The problem or issue (effect) is written along the “backbone” or at the head of the fish and the primary causes are written along the ribs. Sub-causes can be added as extra bones coming off the ribs.

Venn diagram

Concept map

Frayer model

Comparison Matrix

A – Z Review

* In the A –Z Review activity, students are asked to take a concept and try to think of

a word or a phrase that pertains to the concept that begins with every letter of the alphabet

* Students/teams are expected to be able to justify or explain the reason they used a term or phrase.
* For example, if the initial concept was “JUSTICE”, a list might begin like this:

\* A America D Due Process G Gavel

\* B Barristers E Equal

\* C Court F Fair

* Teams can publish their lists or the teacher can direct a report out from each group.

CAPSULE

VOCABULARY

* Vocabulary is truly learned when it can be used naturally in speaking, listening, and writing. Capsule Vocabulary involves four steps: talking, listening, writing and reading.

1. Select 8 to 10 words which relate to a single topic or concept. Write these words on the board.
2. Begin discussing the topic with the class. In your model discussion, include the words.
3. Divide students into pairs. Partners hold a conversation using as many words as they can. Each student keeps track of the words his or her partner uses.
4. Each student writes a summary or brief paper on the topic using the vocabulary words. Students share their summary with their partner.

This capsule strategy can be used as a review of key vocabulary for a test. Or, after a reading assignment, have students list one or two key concepts from their readings and the vocabulary related to the concept.

Circle of Knowledge

* This is a competitive group brainstorming activity, generating brainstorming lists that can then be compared and evaluated by the class.

1. Divide class into teams as small circles. Provide the class with a problem or a concept. For example, why are marshlands important? Or, simply provide the concept “marshland.” Each group is asked to brainstorm answers/solutions to the problem or words that describe/relate to the concept.
2. Teams select a recorder who will compile information into a brainstorming list.
3. Under a time limit, team members, going clockwise around the circle, provide the recorder with ideas for the list. (You might allow one “pass” per team member.)
4. At the end of the time allowed, teams count number of entries collected and the team with the greatest number reads its list aloud while the class and teacher check for duplications, accuracy, etc. The team with the most appropriate entries wins the prize.
5. The teacher acts as judge and final authority.

While the team with the greatest number of entries reads its list, other teams identify those items they have included as well and all teams cross them off their lists. When all duplicates are crossed out, the team with the most unique entries can also win a prize.

Variation: Have team members pass a list around the circle, adding their own ideas *without* any talking. This reduces the noise level and forces each team member to read the list before writing.

CLASSROOM BINGO

* Bingo can be developed as a classroom review game.
* Make Bingo cards by filling in the spaces with items from a list of at least twenty specialized vocabulary terms. These terms should reinforce the concepts to be taught during this particular unit.
* The definitions should be read aloud in random fashion by the teacher.
* The student(s) then covers each term that he/she believes is being read aloud by the teacher.
* The winner is the first student or group that covers a vertical, horizontal, or a diagonal row.
* Be sure to check the winner by rereading the definitions used (Also serves as a review).

**Classroom Bingo Example**

To the Student: Copy 16 of the items from the list below into the squares on the game board, one per square. (From a unit on Atomic Structure, ninth-grade.)

Element, Periodic Table, electron, metal, sodium, chlorine, non-metal, neutron, isotope, ion, proton, nucleus, charge, anion, cation, Rutherford, spectroscope, Bohr, Thomson, atomic mass, atomic number, covalent bond, ionic bond, inference, prediction, metalloid, flame test, or gold foil experiment.

Listen for the clues, decide on the best answer, and cross it out on the game board.

Bingo is five in a row across, vertically or diagonally.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Concept Attainment

Description - An active learning strategy used to identify new concepts and definitions in a non-traditional manner.

Traditional Method of teaching concepts:

Identify the concept by name

Define the concept

Give examples / differentiations

Concept Attainment Method of teaching concepts:

Give examples / differentiations

Define the concept

Identify the concept by name

Process:

1. Share with students a list consisting of examples that illustrate the concept (positive) and examples that do not (negative).
2. Explain that you will identify two positive and two negative examples and that the students should try to determine what the positive examples have in common (that is, the concept that they are trying to attain) and how they differ from the negative examples.
3. As students formulate hypotheses, they may check it by asking about unidentified examples (“Is number two an example of the concept?”), using the yes/no response of the teacher as a guide for correctness.
4. It is important that those students who believe that they have determined the nature of the concept not blurt it out for two reasons:
   1. They may be correct and others will not be able to process/attain the concept for themselves
   2. They may be incorrect, and others will have difficulty getting past the wrong idea stuck in their mind
5. Once the class has grasped the concept or the positive and negative examples have all been identified, a definition of the concept is determined and written on the board by consensus (subtly guided by the teacher to produce the desired definition).
6. When the definition is completed and agreed upon, the concept is given its name.

**Example list** (High School English class)

To the Student: *Mark Positive (+) any examples that illustrate the concept. Mark Negative (-) any examples that do not illustrate the concept.*

Note: Number two is an example of the concept and number seventeen is not.

**Word Pairs**

1. thunderous silence

2. aggressively lazy

3. clearly transparent

4. excruciating pain

5. gregarious hermit

6. genuine phony

7. smelly noise

8. wonderful dancer

9. quietly showy

10. beautiful nightmare

11. military intelligence

12. deadly pet

13. ridiculously funny

14. intimate strangers

15. quiet anticipation

16. excessive moderation

17. worried pessimist

18. generous miser

19. sharp thorns

20. lonely togetherness

21. athletic scholarship

22. delightful poetry

23. openly camouflaged

24. gourmet meal

After five minutes I will answer two “yes” or “no” questions from the class. Do not call out any guesses you might have!!!

After two more minutes, write a description of the concept on your paper.

We will then process the list and you will have an opportunity to clarify your concept description and to “name” the concept.

(Some sample words for biology – paramecium, snake, roundworm, grasshopper, fiber optic cable, human, shrimp, dragonfly larvae, canine, feline, clothes line, ant, lizard and crustacean.)

Data on Display

Description - Participants reflect individually on statements that have been written to elicit varied viewpoints.

1. The participants are to circle the percentage that represents the degree to which they agree with each statement. There are no right answers, it is their opinion that counts.
2. Distribute 3”x 3” post-its to each participant. Direct them to place one post-it (vertically) on each of the chart papers, to represent their response to each question.
3. The post-its will create a visual graph that will be easy to read and interpret.
4. Allow individuals to reflect silently on the data posted around. Look for hypotheses, conclusions, and discrepancies about the patterns of responses.
5. The differences of opinion and/or misleading ideas can lead to good class dialogue.

**Example**: After reading a story or book, the following sentences could be placed around the room.

1. The real hero of the story is \_\_\_\_\_\_\_\_\_\_\_ (fill in name).
2. It is obvious that the author does not believe in religion.
3. Character \_\_\_\_\_\_\_\_ (fill in name) could not survive in the 21st century.
4. Ten years from the end of the story, character \_\_\_\_\_\_\_\_\_ (fill in name) will be very wealthy.
5. In general, the city of Jonesboro is a good place to live.

Human Mapping

The teacher prepares a deck of cards. The deck consists of cards labeled with concepts or terms currently being studied. Remaining cards would consist of the properties, characteristics or attributes of those concepts.

The cards are to be thoroughly shuffled. All members of the class draw a card from the deck (or the teacher simply gives each student a card). Teachers instruct the students that they are to find the “family of cards” where they belong.

The students stand and, without further instruction, walk about the room interviewing the other students about their cards and the information found on them.

The students will match and line themselves according to the information gathered and the categories found on the cards. If the information is sequential then the students arrange the cards like the game of solitaire.

Each family should select a spokesperson to explain how they arrived at their conclusions. Be certain that every card is covered and the rest of the class hears the information about each card.

Hunt for Solutions

1. Review Activity: Students study and review collectively in teams/groups.
2. Place answers on post-its in different places around the room (be sure to include some wrong answers).
3. Have students number off (numbered heads technique).
4. Ask the question and select a number to go retrieve the correct answer (no consultation with members at this point). Check the selections.
5. If right on first attempt receive 2 points.
6. If selection is incorrect the team can consult and go back one time to select correct response (value = 1 point).

Inquiry, Suchman Model

Similar to the game of “20 Questions.”

1. Select a puzzling topic or problem.
2. Explain that students should start with general categories and work their way into more specific ones to narrow the focus.
3. Students are allowed to ask Yes or No questions only. Teacher can answer only in YES or NO format.
4. It is a good idea to repeat each question aloud before answering so all students can collect the necessary information.
5. Students are given only two “guess tickets” (real or imaginary) and a wrong guess at the answer will cost them one ticket. Loss of both tickets eliminates the student from further participation in the game.\*
6. An alternative is to have the student write his or her guess down. If done cooperatively give teams a limited number of “guess coupons”
7. Once the topic or answer is found, review the questioning process that arrived at the solution, discussing the reasoning process and the nature of both the good and bad questions.
8. Though the game should be content driven, the important skill here is the process of inquiry itself, rather than just getting to the correct answer.

Remember: It’s the methodical process of inquiry that you want your students to

Experience rather than just getting the answer.

This strategy is designed to help students improve their ability to ask intelligent questions and to practice critical thinking and listening skills.

**\*Tickets can also be revoked for “dumb” questions, i.e., ones the student should already know the answer to or ones asked and answered when he or she was not paying attention.**

Examples:

I am a famous person. Who am I?

Which element am I?

Mystery Guest?

“An Inquiry Review Game”

Process

Divide your class into four or more teams.

Write on separate cards (or slips of paper) any of the following: I am \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(I am “Leonardo da Vinci” or I am a “metaphor” Content that you are covering in class.)

Examples:

a person an event an artifact

a theory a concept a document

a quotation a formula a literary work

a term a thing a speech or document

Put these cards in a box, and ask each team to choose one card. The card chosen reveals the identity of a mystery guest. (Every student should have selected a card by the end of this process.)

Give the teams five to ten minutes to study the information about the card, decide which team member will serve as the first mystery guest (MG) and establish an order for team members to be the Mystery Guest.

Select one team member from each team to serve on an “inquiry” panel. The panel’s task will be to determine who/what the MG is representing by asking “yes” or “no” questions.

Begin the game by asking the Mystery Guest to reveal his or her category. The panelists take turns asking “yes or no” questions of the mystery guests. Each panelist may get written suggestions for questions from his or her teammates. *Teammates may assist the MG in answering the panel’s “yes or no” questions.*

Select the next team member to serve as the Mystery Guest. Create a new panel for each new guest. *The teacher may decide to go through an entire team before switching to a new team to serve as the Mystery Guests.*

A guess occurs when the panelists asks if the MG is specifically a person or a thing (i.e. Are you George Washington? Are you the Empire State Building? Are you a rhombus? Are you the Fifth Symphony by Beethoven? Are you the distributive property?). The panelist (his or her team) loses two points for a wrong guess. Two wrong guesses and the panelist is eliminated. The panelist who guesses correctly earns five points for his/her team.

Who (What) Am I?

Another Inquiry Questioning Strategy

1. Create index cards with the names of individuals (or terms, concepts) on one side.
2. The participants will receive their cards face down and are not to look at the identity on the back side of the card.
3. With masking tape have a classmate tape your card face up to your back (everyone can see your identity but you).
4. You must determine your identity by asking classmates “yes or no” formatted questions.
5. You must travel around the room and you can ask no more than 2-5 questions of each classmate (or when the students get 3 “no” responses). Then you begin over.
6. Establish a time limit.

Interview Design

Prepare a set of questions about the current concept(s) being studied. These should be questions that would require explanation. For example, “What is an example of an element?” would not be a good question. But, “What is an element?” would be. Higher level questions can be appropriate as well.

For this activity, students will ask (interview) their question to other students. Questions can be randomly selected or assigned by the teacher.

Divide the class into teams. The number of students on each team depends upon the number of questions. If there are four questions, each team should be composed of four students. Pair two teams together so that they are sitting opposite of each other.

Designate one team as the “movers” and one team as the “sitters” and have the teams sit opposite of each other, one on one. In a class of 24 students it could look like this.



STEP 1: Gather the data

Using the question, students have 90 seconds to interview the person sitting across from them, leaving a total of three minutes to conduct each pair of interviews. Record the responses in the space under the question and on the back of the page. Record each person’s responses, even if they are the same as someone else’s. Record their actual responses and not an interpretation. (EACH INTERVIEW SHOULD TAKE NO LONGER THAN 3 MINUTES)

Each person is to interview the other person. At the end of the first 90 seconds the teacher will say, “Switch roles!” at which time the second student begins his or her interview. When time is up for both interviews, the teacher will say, “Movers move!” and the Movers move one chair over and the Sitters stay where they are seated. Repeat this process until all persons have been interviewed with each question. (Initially, the first interviewers will be answering the very same question - - “mover with question A” will ask question A of “sitter with question A” and vice-versa.)

STEP 2: Analyze the Data

After the interview is over, assemble all interviewers who asked the same question (ex. Question A) into groups to compare/prioritize their information. This group should prepare a report for the entire class based on their analysis of the responses to the questions. Record this report on a flip chart, chalkboard, or poster.

STEP 3: Reports and Discussion

Each group report should be 2 – 3 minutes long.

Discussion could occur here or after all groups have reported.

Jigsaw

This is a cooperative learning activity that allows students to study one particular example of a topic in depth before being exposed to several other, similar examples.

1. Teams of equal size are each given a different but related task to complete (analyze a literary work, complete a proof, solve a problem, etc.), making them the expert group for that particular part of the overall assignment.
2. After the team has completed its assignment, each member “counts off” and members from each expert group with the same number re-form to create a new group.
3. The experts from each original group then take turns “teaching” their portion of the assignment.
4. The class can then be debriefed by the teacher, making sure all salient information has been addressed.

Pattern Puzzles

In this activity students move sentences around to form well-organized sequential paragraphs and essays.

It also works well with anything that requires sequencing, such as a historical time line, the steps to a scientific experiment, or the steps to a math problem.

The process:

1. Write each sentence (or pair of sentences), or other variable, on a separate strip of paper. Make a set of strips for each group in the class.

1. Mix up the strips in each set and distribute them to the students (regular letter envelopes come in handy here).
2. The students then organize the individual strips into their understanding of the sequence.
3. In many cases, there may be more than one way to organize the individual strips. Be sure to discuss the relative value of those possible combinations.

Planted Questions

Choose questions that will guide your lesson. Write 3 to 8 questions on index cards and

sequence them logically. Include the cue you will use to signal you want that question asked.

* Cues might include:

Scratching your nose Walking over to the door

Taking off your glasses Stacking papers on your desk

Unfolding your arms Snapping your fingers

Walking down the center aisle to the back of the room

* The question/instruction card may look like this:
* Do Not Show This Card To Anyone
* After I pass back quiz papers, we will begin a lesson about the Bill of Rights. I will ask if there are any questions. When I sit on top of my desk, I want you to raise your hand and ask me the following question:

“Are all of our rights included in the first ten amendments?”

* Do not read this question aloud. Please memorize and put it into your own words.

Select students to be involved and explain their cues to them. Be certain to ask them to not

reveal to anyone else that they are the plants.

Decide on when and where you will want your plants to enter the lesson.

Questioning Review Activity

Cooperative Learning

Hand out two index cards to each student.

Ask each student to complete the following sentences:

* Card 1 I still have a question about\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Card 2 I can answer a question about\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Create subgroups and have each subgroup select the most pertinent question to ask and the

most interesting question to answer from the cards of their group members.

Ask each subgroup to report the question to ask it has selected. Determine if anyone in the full

class can answer the question. If not, the teacher should respond.

Ask each subgroup to report the question to answer it has selected. Have subgroup members

share the answer with the rest of the class.

VARIATIONS:

* Prepare and distribute several question cards in advance. Ask subgroups to choose one or more questions that they are capable of answering.
* Prepare and distribute several answer cards in advance. Ask subgroups to choose one or more answers that they find helpful in reviewing what they have learned.

Send a Problem

* This is a cooperative learning / review activity that asks students to create and answer questions.

1. Have each student in the team write a question related to the unit on an index card.
2. Team members discuss each question and try to provide the answer (which *may* be put on the back of the card).
3. After a predetermined amount of time, teams send their cards to different teams who then try to answer the questions on that set of cards, continuing until all teams have read and answered all questions.
4. Debrief as a whole class, addressing the quality of the questions and answers.

TGT Review

1. Create a deck of cards with content-related questions on them.
2. Prepare as many duplicate decks of cards as there are teams in the class.
3. Team members are divided out, jigsaw fashion, to create competitive groups.
4. Each group is supplied with a deck of question cards.
5. One at a time each person selects a card from the top of the deck, reads the question aloud, and tries to answer the question.
   1. If that student knows the answer and the others at the table agree, he keeps the cards and the next student takes a turn.
   2. If that student does not know the answer and does not want to try to bluff, he passes the card to the next student who can try to answer it in the same fashion.
   3. Questions that are passed all the way around the group with out being answered are put on the bottom of the deck and the next person draws a new card and takes his regular turn.
6. If a group member (from another team) believes the student has answered incorrectly or tried to bluff, he issues a challenge and calls over the teacher who declares the challenge either valid or invalid, but does not provide the correct answer in the case of a valid challenge.
   1. If the challenge is not valid, the challenger must give (or owe) the challenged student a card.
   2. If the challenge is declared valid, the challenged student must give (or owe) the challenger a card. The challenger then has first chance to answer the question correctly, proceeding as if he has drawn the card himself.
   3. After a challenge is completed, the next person to draw a card from the top of the deck should be the one who would have gone next if no challenge had been issued.
7. When all cards have been drawn or the pre-determined time limit is completed, students return to their original teams with the cards they have won.
8. The team that has collected the most (total) cards is declared the winner.

**Hexagon Puzzles – A Review Strategy**

This strategy is designed to evaluate student learning (formative assessment) and to reinforce knowledge and skills. (*Thanks to Ms. Eva Gustavis, Powell Middle School, Jackson, Mississippi*)

Procedure:

1. Arrange several hexagon pieces together in a pattern. The example below includes seven hexagons, but any number will work.
2. Write questions and answers or problems and answers along adjoining edges of each hexagon. (See example on next page.)

1

√16

4

√1

√4

2

√25

√100

5

10

15

√196

√225

14

6

√9

√36

3

7

√49

√625

25

12

√144

1. Cut the hexagons apart. Place in an envelope and give a set to each team of two students.
2. Recognitions (prizes, candy, etc.) can be given to the first teams to complete the task by putting the puzzle together so that corresponding numbers are equalities.
3. Puzzles can be made as difficult or as easy as needed. Unmatched edges can be given numbers as well – this will add to the difficulty level.
4. Science, English or social studies puzzles can be made with vocabulary, states and capitols, measures and values, parts of speech and examples, etc.

The Five Why’s

Purpose: The purpose is to deeply explore a person’s beliefs. The idea is not to debate or challenge the belief, but to get students to think deeply about why the belief is held. This process also helps students learn to focus questions.

Directions:

1. Each student works with a partner.
2. Both partners stand.
3. One person interviews and listens, and the other person responds.
4. The interviewer begins by asking the “why” question assigned. (Students will need practice formatting and asking the next ‘why’ question. A teacher might want to illustrate the procedure with a student or use a video tape from a previous activity.)
5. He/she listens intently to the response of the partner and builds the second “why” question on the first response.
6. Every successive “why” question is built on the last response.
7. When the fifth “why” question has been answered, both partners sit down. (This makes it easy for the teacher to see when everyone has completed the task.

* Students should then sit in groups of four (2 sets of partners) and debrief the questions asked. Each group should list the beliefs expressed by colleagues and then share them with the class.
* During the class discussion a general profile of the class’ belief can be summarized. As a result, the teacher can get a clear picture of what misconceptions the class as a whole may have and can get an ideas as to what direction the next instructional sequence should take.

Example “beginning” questions –

Why is the electoral college part of our presidential election process?

Why is writing a good way to learn?

Why the United States continue to spend money on the space program?

Group Word Sort Activity (with envelopes)

Purpose: To reinforce definitions of key terms and to help students establish a sequential or conceptual hierarchy of key terms.

Procedure:

Give each group of 3 to 4 students two envelopes – one with key terms and one with definitions.

Explain task one – match the term with its definition

Explain task two – arrange the terms and definitions in order based on one of the following criteria or one established by the teacher. This order depends upon the nature of the terms and the goal of the lesson.

1. Simple to complex
2. Specific to general
3. Most important to least important
4. Etc.

The first team to complete both tasks “wins.”

Each group should list their terms in order on the board, chart paper or small white board. Significant class discussion will relate to the order, not the definitions. Allow students the opportunity to “justify” why they choose “their” particular order.

Example:

In a biology class the envelopes could contain the parts of the cell (in envelope 1) and the functions of each part in the other (envelope 2). The order of arrangement could be from most vital to the cell to least vital. (In this case students could begin to understand that all of the parts are vital.)

In an English class the characters in a book or story could be in envelope 1 and their descriptions in envelope 2. The order could be from “most important/central character” to least.

Paired Reading (Retelling)

Purpose: To help students understand/comprehend a reading passage.

Procedure:

Give pairs of students the same passage.

Designate students as #1 and #2.

Student #1 reads aloud the first section (one or two paragraphs).

Student #2, without looking at the text, summarizes what the first student reads aloud.

Both students then look at the text and compare it to their understanding.

Then, the students switch roles, back and forth, until the passage is completed.

Variation:

Both students silently read the passage. Student #1 turn the book over and summarizes/retells what she/he can remember while student #2 looks at the reading passage without interrupting.

When the first student finishes retelling, the second can prompt with questions or add something the first student did not mention.

The students switch roles until the passage is complete.

Teller’s Theater is another way to accomplish this. Students read a selected text passage. In a group, they reread, summarize, and discuss the selection and decide how they will retell the story. Each student then takes a section to retell in story telling fashion.Comparison Matrix

Purpose: To compare characteristics of identified items.

Steps:

Select the items you want to compare

Select the characteristics of the items on which you want to base your comparison

Explain how the items are similar and different with respect to the characteristics

An example matrix for biology – (The student is asked to add one additional item and one characteristic)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Characteristics | Items to be Compared | | | | |
| Pine Tree | Tulip | Elephant | Shark |  |
| External body features | *Similarities* |  |  |  |  |
| *Differences* |  |  |  |  |
| Habitat | *Similarities* |  |  |  |  |
| *Differences* |  |  |  |  |
| Sources of Energy | *Similarities* |  |  |  |  |
| *Differences* |  |  |  |  |
|  | *Similarities* |  |  |  |  |
| *Differences* |  |  |  |  |

Cornell Note Taking

(Two-column or Double Entry Note Taking)

A procedure for helping students organize information from a reading (text). (It can be adapted for lectures.)

Procedure:

Divide the note page into two columns with the first column covering only 1/3 (about 2.5 inches from the left of the paper) of the width of the page.

Explain that topics, key words or main ideas will be written in the first column and descriptions, details and explanations will be written in the second column.

For beginners, you may wish to give them the topics for the first column.

When preparing for an assessment, the student can fold the paper between the two columns (hiding the explanation) and check his/her understanding of the topics.

Example:

If students are reading a description of Cornell Note Taking their notes could look like this.

|  |  |
| --- | --- |
| Topic | Explanation |
| Type of Strategy/Purpose | * Moves the student from passive to active reader. * Good notes are the product of good reading/listening and good notes forces interaction with the text/lecture. * This is the linkage to thinking and comprehension and the result is long-term learning. * Good graphic organizer. |
| Suitable Uses | * Provides students with notes to review before the next class and to use for tests. * When studying, students can fold back the right-hand column and recite the information for each main idea or key word (topic) and then unfold to check for learning and understanding. |
| Preparation | (See above) |
| Materials/Handouts | Paper, edge for drawing vertical line |
| Facilitation Tips | * For struggling students, the main ideas could be printed in advance on a two-column sheet. * Students write what is important about the topic. * Complete the note-taking with a synthesis of the notes at the bottom of the page. This is a personal summary of big understandings from the notes and is written by the student after notes are completed. |
| Using double entry note-taking helps organize my notes in an easy to read format that makes it easier to study and improve my reading and listening comprehension. | |

Newspaper Report

Students write a newspaper, magazine, journal, or tabloid article about something they are studying.

Storyboards

Students recreate story or event sequences graphically, like a comic strip (or, more authentically, the storyboards that are done as part of the movie-making process and which are included with the extras on many DVDs).

Error Analysis

Students are given simulated student work that has errors. They are instructed to find any errors, write a note to the student explaining why it is incorrect and how to do it correctly. This is a good strategy for class sponges. Examples: daily oral language, daily oral geography, etc.

Learning Log/Journal

A learning log is a notebook or binder in content area classrooms where students write for themselves and sometimes for the teacher. Often the logs are kept in the classroom and used to review content. Logs can allow students to reflect, practice, or take interactive notes. Sometimes teachers ask students to use them on a daily basis or a few times per week. Possibly, they can be used several times during a class period.

**Some Notes on Teaching Strategies, Robert Marzano**

This booklet of summarizing strategies is designed to be a toolkit for teachers. These “tools” are but a FEW of the strategies necessary for quality instruction to occur.

What are instructional strategies that work? Robert Marzano (and others) conducted a research review of over 30 years of research (meta-analysis) and found 9 general categories of strategies that contributed the most to student achievement. (Note: These strategies work when conducted in a quality manner. Simply using them does not constitute increased student achievement.)

Marzano’s findings are compiled in two publications published by ASCD, Association for Supervision and Curriculum Development. These are: *Classroom Instruction That Works* and *A Handbook for Classroom Instruction That Works*. The categories of strategies with brief definitions and listed randomly, are:

* **Cooperative learning** (learning groups) – Creating opportunities for students to develop positive interdependence, face-to-face interaction, individual and group accountability, interpersonal and small group skills and group processing.
* **Reinforcing effort and providing recognition** – Teaching students about the role that effort can play in enhancing achievement and recognizing students for working toward an identified level of performance.
* **Homework and practice** – Providing students with opportunities to learn new information and skills and to practice skills they have recently learned.
* **Nonlinguistic representations** (representing knowledge) – Helping students generate nonlinguistic representations of information, including graphic organizers, pictures and pictographs, mental pictures, concrete representations, and kinesthetic activity.
* **Identifying similarities and differences** – Helping students compare, classify, and create metaphors and analogies.
* **Setting goals and providing feedback** – Helping students set their own learning goals in order to establish direction and providing students with timely feedback about their progress.
* **Generating and testing hypotheses** – Helping students generate and test hypotheses trough a variety of tasks, through systems-analysis, problem-solving, historical investigations, invention, experimental inquiry, and decision-making.
* **Summarizing and note taking** – Helping students analyze, sift through, and synthesize information in order to decide which new information is most important to record and remember.
* **Activating prior knowledge** (Cues, questions, and advance organizers) – Helping students retrieve what they already know about a topic.

NOTE: These strategies are designed to be used at different times, in different contexts, and to address different learning objectives. NO INSTRUCTIONAL STRATEGY WORKS EQUALLY WELL IN ALL SITUATIONS.

**Excerpts from: *Classroom Instruction That Works: Research-based Strategies for Increasing Student Achievement***

Robert Marzano, Pickering, D., and Pollock, J.

The premise for the study is that individual teachers can have a profound influence on student learning even in schools that are relatively ineffective. Researchers at Mid-continent Research for Education and Learning (McREL) analyzed selected research studies on instructional strategies – a meta-analysis to determine the average effect of a given technique. An effect size expresses the increase or decrease in achievement of the experimental group in standard deviation units. This can be translated into percentile gain.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Categories of Instructional Strategies That Affect Student Achievement** | | | | |
| **Category** | **Average Effect Size (ES)** | **Percentile Gain** | **Number of ESs** | **Standard Deviation** |
| **Identifying similarities and differences\*** | 1.61 | 45 | 31 | .31 |
| **Summarizing and note taking** | 1.00 | 34 | 179 | .50 |
| **Reinforcing effort and providing recognition\*** | .80 | 29 | 21 | .35 |
| **Homework and practice** | .77 | 28 | 134 | .36 |
| **Nonlinguistic representations** | .75 | 27 | 246 | .40 |
| **Cooperative learning\*** | .73 | 27 | 122 | .40 |
| **Setting objectives and providing feedback** | .61 | 23 | 408 | .28 |
| **Generating and testing hypotheses** | .61 | 23 | 63 | .79 |
| **Activating prior knowledge -**Questions, cues, and advance organizers | .59 | 22 | 1,251 | .26 |

\*Emphasis areas for this booklet